

and seasonal in nature. Remodeling, restoration, and maintenance projects, however, often provide many jobs for painters and paperhangers even when new construction activity declines. The most versatile painters and skilled paperhangers generally are most able to keep working steadily during downturns in the economy.

Earnings

In 1998, median hourly earnings of painters and paperhangers were \$12.07. The middle 50 percent earned between \$9.81 and \$16.16. The lowest 10 percent earned less than \$7.50 and the highest 10 percent earned more than \$21.40. Median hourly earnings in the industries employing the largest numbers of painters and paperhangers in 1997 are shown below:

Local government, except education and hospitals	\$16.90
Painting and paper hanging	11.60
Miscellaneous special trade contractors	11.40
Residential building construction	10.70
Real estate operators and lessors	9.20

In general, paperhangers earn more than painters. Earnings for painters may be reduced on occasion because of bad weather and the short-term nature of many construction jobs.

Hourly wage rates for apprentices usually start at 40 to 50 percent of the rate for experienced workers and increase periodically.

Some painters and paperhangers are members of the International Brotherhood of Painters and Allied Trades. Some maintenance painters are members of other unions.

Related Occupations

Painters and paperhangers apply various coverings to decorate and protect wood, drywall, metal, and other surfaces. Other occupations in which workers apply paints and similar finishes include billboard posterers, metal sprayers, undercoaters, and transportation equipment painters.

Sources of Additional Information

For details about painting and paperhanging apprenticeships or work opportunities, contact local painting and decorating contractors; a local office of the International Brotherhood of Painters and Allied Trades; a local joint union-management apprenticeship committee; or an office of the State apprenticeship agency or State employment service.

For general information about the work of painters and paperhangers, contact:

- ☛ Associated Builders and Contractors, 1300 North 17th St., Rosslyn, VA 22209.
- ☛ International Brotherhood of Painters and Allied Trades, 1750 New York Ave. NW., Washington, DC 20006.
- ☛ Home Builders Institute, National Association of Home Builders, 1201 15th St. NW., Washington, DC 20005.

Plasterers and Stucco Masons

(O*NET 87317)

Significant Points

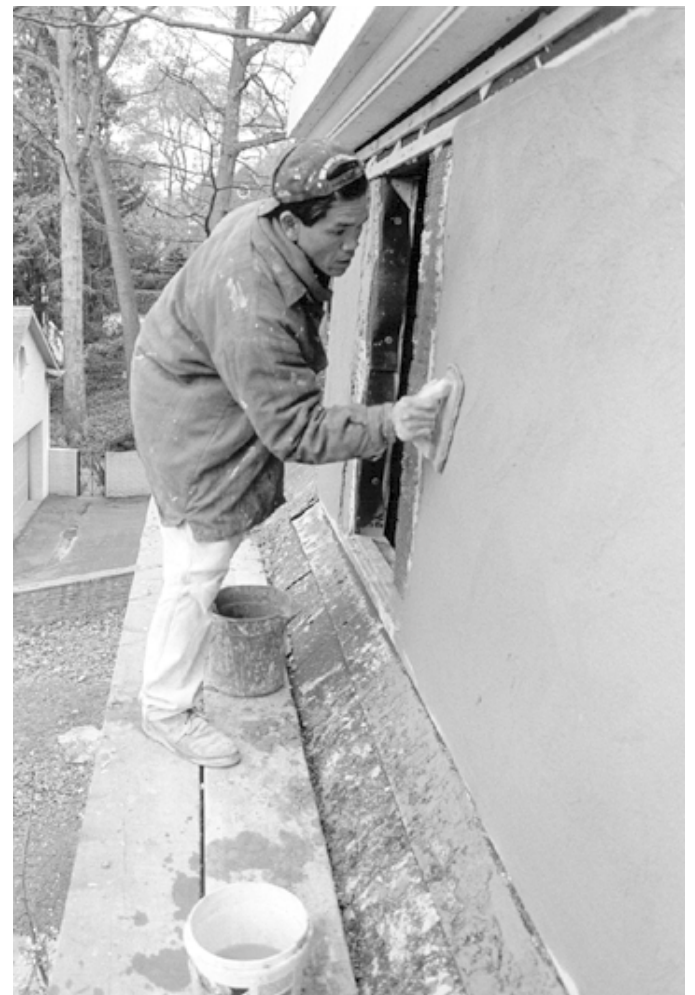
- Plasterers and stucco masons are projected to be one of the fastest growing occupations in construction trades, increasing about as fast as the average for all occupations.
- The use of plaster in new building construction is regaining popularity because of its durability, finish, and fire-retardant qualities.
- Plastering usually is learned on the job, either through a formal apprenticeship program or by working as a helper.

Nature of the Work

Plastering—one of the oldest crafts in the building trades—is enjoying resurgence in popularity because of the introduction of newer, less costly materials and techniques. Plasterers apply plaster to interior walls and ceilings to form fire-resistant and relatively sound-proof surfaces. They also apply plaster veneer over drywall to create smooth or textured abrasion-resistant finishes. In addition, plasterers install prefabricated exterior insulation systems over existing walls—for good insulation and interesting architectural effects—and cast ornamental designs in plaster. Stucco masons apply durable plasters, such as polymer-based acrylic finishes and stucco to exterior surfaces. Drywall workers and lathers, a related occupation, use drywall instead of plaster, when erecting interior walls and ceilings. (See the section on drywall workers and lathers elsewhere in the *Handbook*.)

When plasterers work with interior surfaces such as cinder block and concrete, they first apply a brown coat of gypsum plaster that provides a base, followed by a second or finish coat—also called “white coat”—which is a lime-based plaster. When plastering metal lath (supportive wire mesh) foundations, they apply a preparatory, or “scratch coat,” with a trowel. They spread this rich plaster mixture into and over the metal lath. Before the plaster sets, plasterers scratch its surface with a rake-like tool to produce ridges, so the subsequent brown coat will bond tightly.

Laborers prepare a thick, smooth plaster for the brown coat. Plasterers spray or trowel this mixture onto the surface, then finish by smoothing it to an even, level surface.



Plasterers apply durable plasters such as polymer-based acrylic finishes and stucco to exterior surfaces.

For the finish coat, plasterers prepare a mixture of lime, plaster of Paris, and water. They quickly apply this onto the brown coat using a “hawk”—a light, metal plate with a handle—trowel, brush, and water. This mixture, which sets very quickly, produces a very smooth, durable finish.

Plasterers also work with a plaster material that can be finished in a single coat. This “thin-coat” or gypsum veneer plaster is made of lime and plaster of Paris and is mixed with water at the job site. This plaster provides a smooth, durable, abrasion resistant finish on interior masonry surfaces, special gypsum baseboard, or drywall prepared with a bonding agent.

Plasterers create decorative interior surfaces as well. They do this by pressing a brush or trowel firmly against a wet plaster surface and using a circular hand motion to create decorative swirls.

For exterior work, stucco masons usually apply stucco—a mixture of Portland cement, lime, and sand—over cement, concrete, masonry, or lath. Stucco may also be applied directly to a wire lath with a scratch coat followed by a brown coat and then a finish coat. Stucco masons may also embed marble or gravel chips into the finish coat to achieve a pebblelike, decorative finish.

Increasingly, plasterers apply insulation to the exteriors of new and old buildings. They cover the outer wall with rigid foam insulation board and reinforcing mesh and then trowel on a polymer-based or polymer-modified base coat. They may apply an additional coat of this material with a decorative finish.

Plasterers sometimes do complex decorative and ornamental work that requires special skill and creativity. For example, they may mold intricate wall and ceiling designs. Following an architect’s blueprint, plasterers pour or spray a special plaster into a mold and allow it to set. Workers then remove the molded plaster and put it in place, according to the plan.

Working Conditions

Most plastering jobs are indoors; however, plasterers and stucco masons work outside when applying stucco or exterior wall insulation and decorative finish systems. Sometimes plasterers work on scaffolds high above the ground.

Plastering is physically demanding, requiring considerable standing, bending, lifting, and reaching overhead. The work can be dusty and dirty, soiling shoes and clothing, and can irritate the skin and eyes.

Employment

Plasterers and stucco masons held about 40,000 jobs in 1998. Most plasterers and stucco masons work on new construction sites, particularly where special architectural and lighting effects are part of the work. Some repair and renovate older buildings. Many plasterers and stucco masons are employed in Florida, California, and the Southwest, where exterior plasters with decorative finishes are very popular.

Most plasterers and stucco masons work for independent contractors. About 1 out of every 6 plasterers and stucco masons is self-employed.

Training, Other Qualifications, and Advancement

Although most employers recommend apprenticeship as the best way to learn plastering, many people learn the trade by working as helpers to experienced plasterers and stucco masons. Those who learn the trade informally as helpers usually start by carrying materials, setting up scaffolds, and mixing plaster. Later they learn to apply the scratch, brown, and finish coats.

Apprenticeship programs, sponsored by local joint committees of contractors and unions, generally consist of 2 or 3 years of on-the-job training, in addition to at least 144 hours annually of classroom instruction in drafting, blueprint reading, and mathematics for layout work.

In the classroom, apprentices start with a history of the trade and the industry. They also learn about the uses of plaster, estimating materials and costs, and casting ornamental plaster designs. On the job, they learn about lath bases, plaster mixes, methods of plastering, blueprint reading, and safety. They also learn how to use various tools, such as hand and powered trowels, floats, brushes, straight-

edges, power tools, plaster-mixing machines, and piston-type pumps. Some apprenticeship programs allow individuals to obtain training in related occupations, such as cement masonry and bricklaying.

Applicants for apprentice or helper jobs normally must be at least 17 years old, in good physical condition, and have good manual dexterity. Applicants who have a high school education are preferred. Courses in general mathematics, mechanical drawing, and shop provide a useful background.

Plasterers and stucco masons may advance to supervisors, superintendents, or estimators for plastering contractors or may become self-employed contractors.

Job Outlook

Employment of plasterers and stucco masons is expected to increase about as fast as the average for all occupations through the year 2008. In addition to job openings due to rising demand for plastering and stuccowork, jobs will open as plasterers and stucco masons transfer to other occupations or leave the labor force.

In past years, employment of plasterers declined as more builders switched to drywall construction. This decline has halted, however, and employment of plasterers is expected to continue growing as a result of the appreciation for the durability and attractiveness troweled finishes provide. Thin-coat plastering—or veneering—in particular, is gaining wide acceptance as more and more builders recognize its ease of application, durability, quality of finish, and fire-retarding qualities. An increasing use of prefabricated wall systems as well as new polymer-based or polymer-modified acrylic exterior insulating finishes is also gaining popularity. This is not only because of their durability, attractiveness, and insulating properties but also because of their relatively low cost. These wall systems and finishes are growing in popularity particularly in the South and Southwest regions of the country. In addition, plasterers will be needed to renovate plasterwork in old structures and to create special architectural effects, such as curved surfaces, which are not practical with drywall materials.

Most plasterers and stucco masons work in construction, where prospects fluctuate from year to year due to changing economic conditions. Bad weather affects plastering less than other construction trades because most work is indoors. On exterior surfacing jobs, however, plasterers and stucco masons may lose time because materials cannot be applied under wet or freezing conditions. Best employment opportunities should continue to be in Florida, California, and the Southwest, where exterior plaster and decorative finishes are expected to remain popular.

Earnings

In 1998, median hourly earnings of plasterers and stucco masons were \$14.13. The middle 50 percent earned between \$11.20 and \$18.22. The lowest 10 percent earned less than \$9.05 and the top 10 percent earned more than \$23.69.

According to the limited information available, average hourly earnings—including benefits—for plasterers and stucco masons who belonged to a union and worked full time ranged between \$14.70 and \$39.90 in 1998. Plasterers in New York, Boston, Chicago, San Francisco, Los Angeles, and other large cities received the highest hourly earnings. Apprentice wage rates start at about half the rate paid to experienced plasterers and stucco masons. Annual earnings for plasterers and stucco masons and apprentices can be less than the hourly rate would indicate, because poor weather and periodic declines in construction activity can limit work time.

Many plasterers and stucco masons are members of unions. They are represented by the Operative Plasterers’ and Cement Masons’ International Association of the United States and Canada, or the International Union of Bricklayers and Allied Craftsmen.

Related Occupations

Other construction workers who use a trowel as their primary tool include drywall installers and finishers, bricklayers, cement masons, concrete finishers, marble setters, stonemasons, terrazzo workers, and tilesetters.

Sources of Additional Information

For information about apprenticeships or other work opportunities, contact local plastering contractors, locals of the unions previously mentioned, a local joint union-management apprenticeship committee, or the nearest office of your State apprenticeship agency or your State employment service.

For general information about the work of plasterers and stucco masons, contact:

☛ International Union of Bricklayers and Allied Craftsmen, 815 15th Street, NW., Washington, DC 20005.

☛ Operative Plasterers' and Cement Masons' International Association of the United States and Canada, 14405 Laurel Place, Suite 300, Laurel, MD 20707.

Plumbers, Pipefitters, and Steamfitters

(O*NET 87502A and 87502B)

Significant Points

- Although employment is projected to increase slowly, job opportunities should be excellent because not enough people are seeking training as plumbers, pipefitters, and steamfitters.
- Most workers learn the trade through a formal 4 to 5-year apprenticeship program.
- Plumbers, pipefitters, and steamfitters are one of the largest and highest paid construction occupations.

Nature of the Work

Most people are familiar with plumbers who come to their home to unclog a drain or install an appliance. In addition to these activities, however, plumbers, pipefitters, and steamfitters install, maintain, and repair many different types of pipe systems. For example, some systems move water to a municipal water treatment plant and then to residential, commercial, and public buildings. Other systems dispose of waste, provide gas to stoves and furnaces, or supply air-conditioning. Pipe systems in power plants carry the steam that powers huge turbines. Pipes also are used in manufacturing plants to move material through the production process.

Although plumbing, pipefitting, and steamfitting sometimes are considered a single trade, workers generally specialize in one of these

three areas. *Plumbers* install and repair the water, waste disposal, drainage, and gas systems in homes and commercial and industrial buildings. Plumbers also install plumbing fixtures—bathtubs, showers, sinks, and toilets—and appliances such as dishwashers and water heaters. *Pipefitters* install and repair both high and low-pressure pipe systems used in manufacturing, in the generation of electricity, and in heating and cooling buildings. They also install automatic controls that are increasingly being used to regulate these systems. Some pipefitters specialize in only one type of system. *Steamfitters*, for example, install pipe systems that move liquids or gases under high pressure. *Sprinklerfitters* install automatic fire sprinkler systems in buildings.

Plumbers, pipefitters, and steamfitters use many different materials and construction techniques, depending on the type of project. Residential water systems, for example, use copper, steel, and plastic pipe that can be handled and installed by one or two workers. Municipal sewerage systems, on the other hand, are made of large cast iron pipes; installation normally requires crews of pipefitters. Despite these differences, all plumbers, pipefitters, and steamfitters must be able to follow building plans or blueprints and instructions from supervisors, lay out the job, and work efficiently with the materials and tools of the trade. Increasingly, computers are used to create blueprints and plan layouts.

When construction plumbers install piping in a house, for example, they work from blueprints or drawings that show the planned location of pipes, plumbing fixtures, and appliances. They first lay out the job to fit the piping into the structure of the house with the least waste of material and within the confines of the structure. They then measure and mark areas where pipes will be installed and connected. Construction plumbers also check for obstructions such as electrical wiring and, if necessary, plan the pipe installation around the problem.

Sometimes plumbers have to cut holes in walls, ceilings, and floors of a house. For some systems, they may have to hang steel supports from ceiling joists to hold the pipe in place. To assemble a system, plumbers—using saws, pipe cutters, and pipe-bending machines—cut and bend lengths of pipe. They connect lengths of pipe with fittings with the method depending on the type of pipe used. For plastic pipe, plumbers connect the sections and fittings with adhesives. For copper pipe, they slide fittings over the end of the pipe and solder the fitting in place with a torch.

After the piping is in place in the house, plumbers install the fixtures and appliances and connect the system to the outside water or sewer lines. Finally, using pressure gauges, they check the system, to insure the plumbing works properly.

Working Conditions

Because plumbers, pipefitters, and steamfitters frequently must lift heavy pipes, stand for long periods, and sometimes work in uncomfortable or cramped positions, they need physical strength as well as stamina. They also may have to work outdoors in inclement weather. In addition, they are subject to possible falls from ladders, cuts from sharp tools, and burns from hot pipes or soldering equipment.

Plumbers, pipefitters, and steamfitters engaged in construction generally work a standard 40-hour week; those involved in maintaining pipe systems, including those who provide maintenance services under contract, may have to work evening or weekend shifts, as well as be on call. These maintenance workers may spend quite a bit of time traveling to and from work sites.

Employment

Plumbers and pipefitters held about 426,000 jobs in 1998. About two-thirds worked for mechanical and plumbing contractors engaged in new construction, repair, modernization, or maintenance work. Others did maintenance work for a variety of industrial, commercial, and government employers. For example, pipefitters were employed as maintenance personnel in the petroleum and chemical industries,



Plumbers install and repair waste disposal systems in homes.